



CAIT

Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

PROJECT OVERVIEW REPORT

1. Center Identifying Number

154 RU9178

2. Project Title

Solidification of Soft River Sediments Using Deep Soil Mixing

3. Principal Investigator

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5. Project Objective

Based on the requirements of the NJDOT, we have identified one major objective. The objective is:

Objective 1: Conduct a pilot study to determine the applicability of Cement Deep Soil Mixing technologies in a large-scale project, such as the restoration of the Lower Passaic River.

6. Project Abstract

A pilot study will be conducted to determine the applicability of Cement Deep Soil Mixing technologies in a large-scale project, such as the restoration of the Lower Passaic River. Studies indicate that the Lower Passaic riverbed is contaminated with toxic sediments, and therefore conventional dredging methods would not be effective in remediation of the contamination. Cement Deep Soil Mixing prior to excavation is offered as one alternative to conventional dredging. However, before it can be used in any large-scale project, it must be further evaluated under relevant site-specific conditions.

The Pilot Study consists of two phases: laboratory testing followed by full-scale field testing. Laboratory testing will assess the strength of various mixtures of solidified sediment, each containing different percentages of

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Portland cement slurry. The laboratory testing will determine the percentage of Portland cement slurry that is necessary to ensure the following: 1) that pulverization and dispersion of the sediments do not occur during dredging, 2) that the treated sediments may be excavated using conventional dredging equipment.

Once the laboratory testing is completed, the application of in-situ CDSM will begin. CAIT will engage Raito, Inc., a specialty sub-contractor, to implement the CDSM along the Passaic River at the Darling International Facility in Newark, NJ. After the CDSM has been conducted, approximately 30 days of curing time should be allowed before the treated sediments are dredged. Raito's subcontractor will perform the excavation and disposal.

7. Task Descriptions

Phase 1: Literature Review

Phase 2: Laboratory and Field Testing

Task 1- Assessment of the strength of various mixtures of solidified sediment, each containing different percentages of Portland cement slurry.

Task 2- Subsurface investigation will be performed to determine the physical properties and the thickness of the native soil layers within the test area.

Task 3- In-Situ Sediment Mixing.

Task 4 - In-Situ Strength Testing.

Task 5- Analysis of Total Suspended Solids.

Task 6- Evacuation and disposal of solidified sediments.

Task 7- Final Report.

8. Milestones/Dates

Phase 1: Literature Review 1/31/2005

Phase 2: Laboratory and Field Testing

Task 1- Solidified Sediment Analysis 3/1/2005

Task 2: Subsurface Investigation 3/31/2005

Task 3: In-Situ Sediment Mixing 4/30/2005

Task 4: In-Situ Strength Testing 6/30/2005

Task 5: Analysis of Suspended Solids 6/30/2005

Task 6: Evacuation and Disposal 7/1/2005

Task 7: Final Report 8/5/2005



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9. Yearly and Total Budget

	Year One & Total Budget	
NJDOT Sponsorship	(8/6/2004-8/5/2005)	\$418,000
USDOT Sponsorship	(8/6/2004-8/5/2005)	\$132,978
	TOTAL	\$550,978

10. Student Involvement

One (1) Graduate Student Researcher

11. Relationship to Other Research Projects

None to Date

12. Technology Transfer Activities

A final report will be developed and distributed that that interprets the trends and analysis of the respective TSS sampling events.

13. Potential Benefits of the Project

- An alternative to traditional dredging methods.
- The proper removal of toxic sediments to avoid negative impact to the environment and human health.
- Mitigation of risks associated with sediment dispersion during dredging and transportation.
- Final Report and Recommendations.

14. TRB Keywords

Sediments, Cement, Soil remediation, Mixing, Dredging

15. TRB Code Words

Rbebs, Rbmdfc, Jfgys, Fcbp, Fcfxeud